

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (previously presented) A plant comprising:
 - a solvent source that is configured to provide a carbon dioxide-depleted lean hydrogen sulfide-containing physical solvent;
 - a vacuum stripper coupled to the solvent source and configured to produce an ultra-lean physical solvent from the carbon dioxide-depleted hydrogen sulfide-containing lean physical solvent; and
 - at least one of a high-pressure flash vessel and a medium pressure flash vessel coupled via respective conduits to the vacuum stripper, wherein the conduits and the at least one of the high-pressure flash vessel and the medium pressure flash vessel are configured to provide a substantially hydrogen sulfide-free stripping gas from the at least one of the high-pressure flash vessel and the medium pressure flash vessel to the vacuum stripper.
2. (previously presented) The plant of claim 1 further comprising an absorber that is configured to receive the ultra-lean physical solvent and that is further configured to operate with an isothermal gradient or with a decreasing top-to-bottom thermal gradient.
3. (previously presented) The plant of claim 2 wherein the absorber is configured to receive a feed gas that comprises at least 10 mol% carbon dioxide and at least 500 ppm hydrogen sulfide.
4. (Original) The plant of claim 3 wherein the feed gas has a pressure of at least 1000 psig.
5. (Original) The plant of claim 4 wherein the feed gas is at least partially dehydrated, and wherein the at least partially dehydrated feed gas is further cooled by a rich solvent.
6. (Original) The plant of claim 1 wherein the lean hydrogen sulfide-containing physical solvent comprises at least 100 ppm hydrogen sulfide, and wherein the ultra-lean physical solvent comprises less than 100 ppm hydrogen sulfide.

7. (Original) The plant of claim 6 wherein the ultra-lean solvent comprises less than 10 ppm hydrogen sulfide.
8. (Original) The plant of claim 1 wherein the lean hydrogen sulfide-containing physical solvent is selected from the group consisting of propylene carbonate, n-methyl pyrrolidone, dimethyl ether of polyethylene glycol, and tributyl phosphate.
9. (Original) The plant of claim 1 wherein the substantially hydrogen sulfide-free stripping gas comprises at least 95 mol% carbon dioxide.
10. (previously presented) The plant of claim 1 wherein the solvent source comprises a separator in which acid gas is separated from a rich solvent, thereby producing the lean hydrogen sulfide-containing physical solvent, and wherein the plant is further configured such that part of the acid gas can be compressed and injected into a formation.
11. (Original) The plant of claim 10 wherein the vacuum stripper further produces a second acid gas that is combined with the acid gas from the separator.
12. (currently amended) A method of producing an ultra-lean physical solvent, comprising: separating in at least one of a high-pressure flash vessel and a medium pressure flash vessel a substantially hydrogen sulfide-free stripping gas from a physical solvent; further reducing pressure in the physical solvent to remove carbon dioxide and to so form a carbon dioxide-depleted lean hydrogen sulfide-containing physical solvent; and feeding the substantially hydrogen sulfide-free stripping gas into a vacuum stripper to thereby strip hydrogen sulfide from the carbon dioxide-depleted lean hydrogen sulfide-containing physical solvent in the vacuum stripper to so form the ultra-lean physical solvent; and feeding the ultra-lean physical solvent to an absorber, and operating the absorber with an isothermal gradient or with a decreasing top-to-bottom thermal gradient.
13. (canceled).

14. (currently amended) The method of claim [[13]] 12 further comprising a step of feeding a feed gas to the absorber at a pressure of at least 1000 psig, wherein the feed gas comprises at least 10 mol% carbon dioxide and at least 500 ppm hydrogen sulfide.
15. (Original) The method of claim 12 wherein the lean hydrogen sulfide-containing physical solvent is selected from the group consisting of propylene carbonate, n-methyl pyrrolidone, dimethyl ether of polyethylene glycol, and tributyl phosphate.
16. (Original) The method of claim 12 wherein the substantially hydrogen sulfide-free stripping gas comprises at least 95 mol% carbon dioxide.
17. (New) A method of producing an ultra-lean physical solvent, comprising:
producing in an absorber an acid gas enriched physical solvent;
separating in at least one of a high-pressure flash vessel and a medium pressure flash vessel a substantially hydrogen sulfide-free flashed hydrocarbon vapor from the acid gas enriched physical solvent to so produce a flashed solvent;
recycling one portion of the substantially hydrogen sulfide-free flashed hydrocarbon vapor to the absorber, and using another portion of the substantially hydrogen sulfide-free flashed hydrocarbon vapor as a stripping gas;
further reducing pressure of the flashed solvent and separating the pressure-reduced flashed solvent into a carbon dioxide stream and a carbon dioxide-depleted lean hydrogen sulfide-containing physical solvent; and
stripping hydrogen sulfide from the carbon dioxide-depleted lean hydrogen sulfide-containing physical solvent in a vacuum stripper using the stripping gas to so form the ultra-lean physical solvent.
18. (New) The method of claim 17 wherein the step of separating is performed in the high-pressure flash vessel and the medium pressure flash vessel.